Appendix 4H

Constituent vs Constituent Graphical Analysis

This project conducted constituent versus constituent graphical analysis to chemically identify sources contributing nitrate to Lower Umatilla Basin groundwater. Data presumably representing areas influenced by a single land use activity appeared as distinct groupings (fields) on chloride versus potassium, bromide versus potassium, and chloride/bromide versus chloride graphs. Not all potential sources are represented. Omitting these other sources should not be interpreted as vindicating their role as a nitrate contributor to the basin's groundwater.

Lower Umatilla Basin groundwater sampling data related to other areas were similarly graphed. Project analysis compared and noted where the other area data plotted relative to data fields presumably representing single land use activity influences.

The comparisons help indicate land uses possibly influencing local groundwater. The results alone are not conclusive. For example, some data related to areas with apparently no food processing activity graphed within the presumably food processing field. This and similar situations indicates a need to consider the comparison results with other analyses and information to properly identify local land use influences upon groundwater.

The results of the comparisons are presented in the tables that follow. Each table groups sampling sites within a common geographic area.

Table 4H.1 Constituent versus constituent analyses to identify human activity influencing Threemile Canyon and Sixmile Canyon area groundwater.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 271	Basalt (Elephant Mtn)	C	none above FP	FP & I
UMA 272	Basalt (multiple)	I	none near I	FP
UMA 273	Basalt (Elephant Mtn)	C	none near I & C	FP & I
UMA 274	Alluvial	none beyond I	none beyond I	FP
UMA 275	Alluvial	none beyond I	none beyond I	none beyond FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for Bromide

Note: This investigation identified no food processing wastewater land application occurring in this area. The FP is interpreted as representing irrigation related activity.

Table 4H.2 Constituent versus constituent analyses to identify human activity influencing Boardman area groundwater.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 002	Alluvial	FP	FP	FP
UMA 003	Basalt (basal Elephant Mtn)	none left of FP	FP	FP
UMA 028	Basalt (basal Elephant Mtn)	S	none near S	FP & I
UMA 029	Basalt (basal Elephant Mtn)	FP	FP	FP
UMA 030	Basalt (basal Elephant Mtn)	C	C	FP & I
UMA 031	Alluvial	I	none near I	C & FP
UMA 085	Alluvial	C	none between FP & C	FP
UMA 086	Alluvial	none near C & S	S	C & I
UMA 129	Basalt (basal Elephant Mtn/ Rattlesnake Ridge)	I	none near I	FP
UMA 170	Basalt (sub-Selah)	FP	FP	FP & I
UMA 179	Basalt (basal Elephant Mtn/ Rattlesnake Ridge)	FP	none left of S	ND
UMA 233	Alluvial- basal Elephant Mtn	--	--	FP next to I

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.3 Constituent versus constituent analyses to identify human activity influencing Port of Morrow area groundwater east of Boardman.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 176	Alluvial	I	I	I & C & FP
UMA 177	Alluvial	C	C	FP & I
UMA 178	Alluvial	I	none between C & I	FP next to C
UMA 201	Alluvial	C	none between C & I	FP
UMA 231	Alluvial	S next to I	S	S
UMA 232	Alluvial	I & S	I	S & I & FP

Note:
C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Table 4H.4 Constituent versus constituent analyses to identify human activity influencing groundwater in a crop irrigation area east of Boardman.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 159	Alluvial	I	I	I
UMA 160	Alluvial	--	I	I & S & FP
UMA 161	Alluvial	none beyond I	none near I	none beyond I
UMA 163	Alluvial	FP	none near S	ND
UMA 173	Alluvial	I	I	I
UMA 174	Alluvial	I	I	I
UMA 176	Alluvial	I	I	I & C & FP
UMA 231	Alluvial	S next to I	S	S
UMA 232	Alluvial	I & S	I	S & I & FP
UMA 270	Alluvial	S	C	S & I & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.5 Constituent versus constituent analyses to identify human activity influencing groundwater in the Irrigon area.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 026	Alluvial	S & I	S	S next to C
UMA 032	Alluvial	S	none near S	S
UMA 033	Alluvial	S	S	ND
UMA 034	Alluvial	S	S	ND
UMA 036	Alluvial	S	S	S
UMA 053	Alluvial	I	S	I & C
UMA 059	Alluvial	S	I near S	I & S & FP
UMA 099	Alluvial	S	S	ND
UMA 100	Alluvial	S	S	S & FP
UMA 102	Alluvial	S	S	S & FP
UMA 103	Alluvial	none between FP & C & S	none between C & FP	S & FP
UMA 144	Alluvial	S	S	S
UMA 180	Alluvial	FP & C	C	FP beyond C
UMA 266	Alluvial	I	I next to S	S
UMA 267	Alluvial	none next to I	S	none beyond I
UMA 268	Alluvial	C	C next to S	S
UMA 269	Basalt (basal Pomona)	S near I	I	I & S & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.6 Constituent versus constituent analyses to identify human activity influencing groundwater in the Irrigon to Umatilla area.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 037	Alluvial	C	C	I & FP
UMA 038	Alluvial	C & S	C	C & I & FP
UMA 054	Basalt	I	I	I & FP
UMA 095	Basalt (2 zones)	none right of S	I	I & FP
UMA 096	Alluvial	none next to C	none next to C & S	I & C
UMA 097	Alluvial	none next to S	none near C	I & FP next to S
UMA 103	Alluvial	none between FP & C & S	none between C & FP	S & FP
UMA 164	Basalt (basal Elephant Mtn/ Rattlesnake Ridge)	S	S	ND
UMA 269	Basalt (basal Pomona)	S near I	I	I & S & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.7 Constituent versus constituent analyses to identify human activity influencing groundwater in the U.S. Army Umatilla Depot Activity Ammunition Demolition Area (western Depot area).

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 202	Alluvial	S	FP	S & I & FP
UMA 203	Alluvial	S & I	I	S & I
UMA 204	Alluvial	I	none near I	FP
UMA 205	Alluvial	S	none between C & FP	I & S & FP
UMA 206	Alluvial	S next to I	I	I & S & FP
UMA 213	Alluvial	S	FP	S
UMA 214	Alluvial	I	I	C
UMA 215	Alluvial	none next to I	none above I	FP
UMA 276	Alluvial	S & I	I	I & S & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Constituent versus constituent fields representative of Depot activities were not established.

Table 4H.8 Constituent versus constituent analyses to identify human activity influencing groundwater in the U.S. Army Umatilla Depot Activity Active Landfill Area (northeast Depot area).

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 208	Alluvial	none left of FP	none left of FP	FP
UMA 219	Alluvial	none left of FP	none left of FP	FP
UMA 220	Alluvial	FP	none left of FP	S
UMA 222	Alluvial	FP	none left of FP	FP
UMA 223	Alluvial	none near FP & C & S	none left of FP	none below FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Constituent versus constituent fields representative of Depot activities were not established.

Table 4H.9 Constituent versus constituent analyses to identify human activity influencing groundwater in the U.S. Army Umatilla Depot Activity Explosive Washout Lagoon Area (central Depot area).

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 209	Alluvial	FP	none left of FP	S
UMA 210	Alluvial	FP	none next to FP	I & FP
UMA 221	Alluvial	FP	none next to FP	I & S & FP
UMA 224	Alluvial	I	I	I & FP
UMA 225	Alluvial	none right of S	none right of I	I & S & FP
UMA 226	Alluvial	S	next to FP	I & S & FP
UMA 227	Alluvial	FP	FP	I & S & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Constituent versus constituent fields representative of Depot activities were not established.

Table 4H.10 Constituent versus constituent analyses to identify human activity influencing groundwater in the U.S. Army Umatilla Depot Activity General and Inactive Landfill Areas (southern Depot area).

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 207	Alluvial	S	FP	S & I & FP
UMA 211	Alluvial	S	none next to S	S next to FP & I & C
UMA 212	Alluvial	S & FP	none between S & FP	S & I & FP
UMA 216	Alluvial	none left of FP	none left of FP	FP near I
UMA 218	Alluvial	FP	none left of FP	I & FP
UMA 228	Alluvial	FP	none left of FP	I & FP & S
UMA 229	Alluvial	S	none next to FP	S & I & FP
UMA 230	Alluvial	FP	none next to FP	I & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Constituent versus constituent fields representative of Depot activities were not established.

Table 4H.11 Constituent versus constituent analyses to identify human activity influencing groundwater in the agricultural area south of the U.S. Army Umatilla Depot Activity.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 079	Basalt?	FP	none near S	ND
UMA 112	Alluvial	none between FP & S	none next to S	S
UMA 133	Alluvial	FP	none between C & FP	C & FP
UMA 165	Basalt	FP	none near S	ND
UMA 166	Alluvial	none right of S	none right of S	ND
UMA 167	Alluvial	FP	FP	I & FP
UMA 168	Alluvial	FP	none between S & FP	S & FP
UMA 172	Basalt (upper Pomona?)	FP	FP	I & FP
UMA 181	Alluvial	FP	none left of S	ND
UMA 182	Alluvial	C	C	C & I
UMA 183	Alluvial	FP	FP	C & FP
UMA 184	Alluvial	FP	FP	S & I & FP
UMA 194	Basalt (basal Pomona?)	S	none near FP	S & I & FP
UMA 239	Alluvial	FP	FP	S & FP
UMA 240	Alluvial	none left of FP	none left of FP	FP
UMA 241	Alluvial	none right of S	none right of FP	S

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.12 Constituent versus constituent analyses to identify human activity influencing groundwater in the Butter Creek Area south of Interstate 84.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 080	Alluvial	FP & S	none next to S	S & I & FP
UMA 120	Alluvial	FP	none next to S	ND
UMA 122	Alluvial	FP	FP	FP
UMA 185	Alluvial	FP	none next to S	ND
UMA 186	Alluvial	S	FP	S & I & FP
UMA 187	Alluvial	FP	none left of FP	S & I & FP
UMA 242	Alluvial (shallow unconfined)	FP	FP	FP
UMA 249	Alluvial (shallow unconfined)	S	none near C & S	S & I & FP
UMA 251	Alluvial	FP	FP	FP
UMA 252	Alluvial	FP	FP	FP
UMA 253	Alluvial	FP	FP	FP
UMA 254	Alluvial (shallow unconfined)	S near FP	none between FP & S & C	S & I & FP
UMA 255	Alluvial (shallow unconfined)	S near FP	none next to FP	S & I & FP
UMA 256	Alluvial (shallow unconfined)	FP	FP	S & I & FP
UMA 257	Alluvial (shallow unconfined)	S	none between FP & S & C	S & I & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.13 Constituent versus constituent analyses to identify human activity influencing groundwater in the Butter Creek-Umatilla River confluence area.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 058	Alluvial	none between FP & I	none above I	FP
UMA 080	Alluvial	FP	none between FP & S	FP & S
UMA 081	Alluvial	C	C next to I	C
UMA 122	Alluvial	FP	FP	FP
UMA 245	Alluvial	FP	none between FP & S	S outside of FP & I
UMA 246	Alluvial (shallow unconfined)	C	C	FP
UMA 247	Alluvial	S	S	S & FP
UMA 248	Alluvial (shallow unconfined)	C	I	I & C
UMA 249	Alluvial (shallow unconfined)	S	none between FP & S & C	FP & I & S
UMA 250	Alluvial (shallow unconfined)	none between FP & I	none above I	FP
UMA 258	Alluvial (shallow unconfined)	FP	FP	FP
UMA 261	Alluvial (shallow unconfined)	FP	FP	FP & I

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.14 Constituent versus constituent analyses to identify human activity influencing groundwater in the Butter Creek Highway (Hwy 207) area north of Interstate 84 and east of the Umatilla River.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 069	Alluvial	C	C	C & I & FP
UMA 070	Alluvial	S	S	ND
UMA 072	Alluvial	S & I	I next to S	S & I & FP
UMA 073	Alluvial	S next to FP	FP	S & I & FP
UMA 077	Alluvial	FP	none between S & FP	S
UMA 081	Alluvial	C	C	C & FP
UMA 084	Alluvial	C	C	C & FP
UMA 088	Alluvial	none next to S & FP	S	C next to S
UMA 089	Alluvial	C	C	I & FP
UMA 119	Alluvial	C	C next to S	C & I
UMA 121	Alluvial	none next to FP	none next to FP	S & FP
UMA 134	Alluvial	C	C	C & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.15 Constituent versus constituent analyses to identify human activity influencing groundwater in the Butter Creek Highway (Hwy 207) area north of Interstate 84 and west of the Umatilla River.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 063	Alluvial	FP	FP	S & FP
UMA 078	Alluvial	S	S	S
UMA 088	Alluvial	none next to S & FP	S	C next to S
UMA 092	Alluvial	S	S	S
UMA 094	Alluvial	S next to FP	S	C
UMA 136	Alluvial	S & FP	S	S
UMA 138	Alluvial and Basalt	S	none next to S	S
UMA 181	Alluvial	FP	none left of S	ND
UMA 198	Alluvial	FP	none left of FP	FP
UMA 207	Alluvial	S	FP	S & FP & I
UMA 234	Alluvial	FP	FP	FP & C
UMA 235	Alluvial	FP	FP	FP next to I
UMA 236	Alluvial	FP	none between FP & S	S next to FP
UMA 237	Alluvial (shallow unconfined)	FP	FP	FP
UMA 238	Alluvial (shallow unconfined)	FP	FP	FP & I
UMA 243	Alluvial	I	S next to I	none next to I

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.16 Constituent versus constituent analyses to identify human activity influencing groundwater in the City of Umatilla and Hat Rock areas.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 037	Alluvial	C	C	I & FP
UMA 038	Alluvial	C & S	C	C & I & FP
UMA 065	Alluvial	none beyond I	none beyond I	FP
UMA 066	Alluvial	C & S	C	C & I & S & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.17 Constituent versus constituent analyses to identify human activity influencing groundwater in the terrace north of Hermiston.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 039	Alluvial	S	S	S
UMA 040	Alluvial	S	none right of S	ND
UMA 055	Alluvial	S	S	S
UMA 057	Alluvial	S	S	S
UMA 090	Uncertain	S	NA	NA
UMA 104	Alluvial	S	S	ND
UMA 106	Basalt (basal Pomona)	S	S	S & FP next to I
UMA 108	Uncertain	C	NA	NA
UMA 109	Alluvial	S	S	S & FP
UMA 113	Uncertain	S next to I	NA	NA
UMA 114	Alluvial and Basalt	S	NA	NA
UMA 116	Alluvial	S	none next to S & C	S & I & FP
UMA 117	Alluvial	S	S	S & FP
UMA 149	Uncertain	S & I	NA	NA
UMA 153	Uncertain	I	NA	NA
UMA 154	Uncertain	I	NA	NA
UMA 158	Uncertain	I	NA	NA

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.18 Constituent versus constituent analyses to identify human activity influencing groundwater in the Hermiston basin/trough.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 041	Alluvial	S	S	S
UMA 060	Alluvial	S	S	S
UMA 064	Alluvial	S	S & I	S & I & FP
UMA 068	Alluvial	none beyond S	none beyond I	S & FP
UMA 070	Alluvial	S	S	ND
UMA 072	Alluvial	S & I	I	S & I & FP
UMA 074	Alluvial	S	S	S
UMA 075	Uncertain	S & I	NA	NA
UMA 076	Alluvial	S	S & I	S
UMA 077	Alluvial	FP	none between FP & S	S
UMA 107	Alluvial and Basalt	S	NA	NA
UMA 115	Uncertain	none left of FP	NA	NA
UMA 126	Basalt (3 zones)	none right of S	none right of I	S & FP next to I
UMA 150	Uncertain	S	NA	NA
UMA 278	Alluvial	S	none between FP & C	S & I & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.19 Constituent versus constituent analyses to identify human activity influencing groundwater in the terrace south of Hermiston.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 042	Alluvial	S	S	S & FP
UMA 043	Alluvial	S	none between C & S & FP	S & FP & I
UMA 044	Alluvial	FP & S	FP and between C & S	I & FP
UMA 045	Alluvial	S	none left of S	ND
UMA 046	Alluvial	FP	none left of S	ND
UMA 052	Alluvial	FP	FP	S & FP & I
UMA 056	Alluvial	FP	FP	FP
UMA 082	Alluvial	C	C	I & FP
UMA 087	Alluvial and Basalt	S	NA	NA
UMA 101	Alluvial	FP	FP	FP
UMA 110	Alluvial	S	none left of S	ND
UMA 111	Alluvial	none next to FP	none near S	ND
UMA 124	Alluvial	none next to S, near FP	none between FP & C	FP & I
UMA 125	Basalt (basal Pomona?)	FP	S	I
UMA 151	Alluvial and Basalt	S	NA	NA
UMA 152	Uncertain	S	NA	NA
UMA 155	Uncertain	S	NA	NA
UMA 156	Alluvial	S	none left of S	ND
UMA 195	Alluvial	FP	none left of S	ND
UMA 200	Alluvial	FP	none near FP	S
UMA 263	Alluvial	none left of FP	none left of FP	FP

UMA 264	Alluvial	FP	none left of FP	FP
UMA 265	Alluvial	FP	FP	S & I & FP
UMA 278	Alluvial	S	none between FP & C	S & I & FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide

Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.

Table 4H.20 Constituent versus constituent analyses to identify human activity influencing groundwater in the Echo Meadows and Umatilla Meadows area.

Well	Aquifer	Cl vs K Graphs	Br vs K Graphs	Cl/Br vs Cl Graphs
UMA 047	Basalt	FP	FP	FP & I & S
UMA 048	Alluvial	FP	none near FP	S & FP next to I
UMA 049	Alluvial	FP	none left of S	ND
UMA 051	Basalt (multiple)	none beyond S	none beyond I	FP & S & I
UMA 052	Alluvial	FP	FP	FP & S & I
UMA 118	Basalt?	S	S	ND
UMA 188	Basalt (multiple)	none beyond I	none beyond I	FP
UMA 189	Alluvial	FP	none left of S	ND
UMA 190	Alluvial	FP	none left of S	ND
UMA 191	Alluvial	FP	none between FP & S	S next to FP
UMA 192	Alluvial	I	S	S & FP next to I
UMA 193	Alluvial	FP	none left of S	ND
UMA 196	Basalt?	FP	FP	FP & I & S
UMA 244	Alluvial (shallow unconfined)	FP	none left of S	ND
UMA 259	Alluvial	FP	none left of S	ND
UMA 260	Alluvial (shallow unconfined)	FP	none between FP & S	C & I
UMA 262	Alluvial	S next to I	S	S next to FP

Note: C = Confined Animal Operation
I = Irrigated Crop Agriculture
FP = Food Processing Wastewater
S = Septic System
ND = Bromide not detected by laboratory analysis
NA = No laboratory analysis for bromide
Note: Some FP in the table are interpreted as representing irrigation related activity based upon local land use activity identified.